

What is claimed is:

1. A molecule having an antigen binding region specific for an epitope of the Fas antigen, said epitope being conserved between a primate and a non-primate animal.
2. The molecule of claim 1, wherein the primate is human.
3. The molecule of claim 1, wherein the non-primate is a rodent.
4. The molecule of claim 3, wherein the rodent is a mouse.
5. The molecule of claim 1, wherein the primate is human and the non-primate animal is a mouse.
6. A molecule having an antigen binding region specific for a conserved, mammalian Fas epitope.
7. An antibody produced by the hybridoma HFE7A having the accession number FERM BP-5828.
8. A molecule having at least six antibody CDR's, said antibody being specific for human Fas, wherein said CDR's have identity with the CDR's of the antibody produced by the hybridoma HFE7A having the accession number FERM BP-5828.

9. A molecule having an antigen binding region, said binding region having specificity for the antigenic determinant recognized by the antibody produced by the hybridoma HFE7A having the accession number FERM BP-5828.

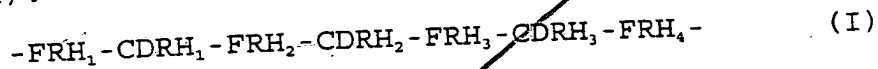
10. The molecule of claim 1, which is an antibody.

11. The molecule of claim 6, which is an antibody.

12. The molecule of claim 8, which is an antibody.

13. The molecule of claim 9, which is an antibody.

14. A molecule comprising a light polypeptide chain and a heavy polypeptide chain, the heavy chain having the following formula (I):



wherein FRH₁ represents an amino acid sequence having 18 to 30 amino acids, CDRH₁ represents the sequence of SEQ ID NO: 2, FRH₂ represents an amino acid sequence having 14 amino acids, CDRH₂ represents the sequence of SEQ ID NO: 3, FRH₃ represents an amino acid sequence having 32 amino acids, CDRH₃ represents the sequence of SEQ ID NO: 4, FRH₄ represents an amino acid sequence having 11 amino acids, and each amino acid binds to another amino acid via a peptide bond,

the light chain having the following formula (II):



wherein FRL₁ represents an amino acid sequence having 23 amino acids, CDRL₁ represents the sequence of SEQ ID NO: 5, FRL₂ represents an amino acid sequence having 15 amino acids, CDRL₂ represents the sequence of SEQ ID NO: 6, FRL₃ represents an amino acid sequence having 32 amino acids, CDRL₃ represents the sequence of SEQ ID NO: 7, FRL₄ represents an amino acid sequence having 10 amino acids, and each amino acid binds to another amino acid via a peptide bond.

3. 15. The molecule of claim 14, which is an antibody.

16. The antibody of any of claims 10, 11, 12, 13 or 15, which is an immunoglobulin G antibody.

17. The molecule of any of claims 1 to 6, 8, 9 or 14, which is humanized.

18. The antibody of any of claims 7, 10, 11, 12, 13 or 15, which is humanized.

19. The molecule of claim 1, which induces apoptosis in abnormal cells expressing Fas, and which inhibits apoptosis in normal cells.

20. The molecule of claim 8, which induces apoptosis in abnormal cells expressing Fas, and which inhibits apoptosis in normal cells.

21. A method to evaluate therapies for conditions in humans affected by the Fas/Fas ligand interaction, comprising introducing the molecule of claim 8 into an animal which is a model for said conditions, and evaluating said conditions exhibited by the animal.

22. A humanized molecule having an antigen binding region specific for an epitope of the Fas antigen conserved between a primate and a non-primate animal, said molecule obtained by grafting the respective CDR's from an antibody specific for said epitope of the Fas antigen into each of at least one human light chain, or fragment thereof, and at least one human heavy chain, or fragment thereof.

23. The molecule of claim 22, the antibody from which the CDR's are obtained having variable regions comprising said CDR's, and wherein said human light and heavy chains are selected on the basis of closest similarity between variable regions comprised therein and the variable regions of said antibody.

24. The molecule of claim 22, wherein significant amino acids, from framework regions comprised in an epitope recognition site

of the antibody from which the CDR's are obtained, are also grafted into said heavy and light chains to maintain structure in the epitope recognition site.

25. The molecule of any of claims 1, 6, 8 or 9 that binds a peptide comprising the amino acid sequence of SEQ ID NO: 1.

26. The molecule of any of claims 1, 6, 8 or 9 that comprises a light chain polypeptide protein selected individually from the group consisting of the amino acid sequence 1 to 218 of SEQ ID NO: 50, the amino acid sequence 1 to 218 of SEQ ID NO: 52, the amino acid sequence 1 to 218 of SEQ ID NO: 54, the amino acid sequence 1 to 218 of SEQ ID NO: 107 and the amino acid sequence 1 to 218 of SEQ ID NO: 109.

27. The molecule of any of claims 1, 6, 8 or 9 that comprises a heavy chain polypeptide protein selected individually from the group consisting of the amino acid sequence 1 to 451 of SEQ ID NO: 89 and the amino acid sequence 1 to 451 of SEQ ID NO: 117.

28. The molecule of any of claims 1, 6, 8 or 9 that comprises a light chain polypeptide protein having the amino acid sequence 1 to 218 of SEQ ID NO: 50, and a heavy chain polypeptide protein having the amino acid sequence 1 to 451 of SEQ ID NO: 89.

Sub B3
29. The molecule of any of claims 1, 6, 8 or 9 that comprises a light chain polypeptide protein having the amino acid sequence 1 to 218 of SEQ ID NO: 107, and a heavy chain polypeptide protein having the amino acid sequence 1 to 451 of SEQ ID NO: 117.

30. A DNA encoding a single polypeptide portion of a molecule of any of claims 1, 6, 8 or 9.

31. A DNA comprising a nucleotide sequence selected from the group consisting of the nucleotide sequence 100 to 753 of SEQ ID NO: 49, the nucleotide sequence 100 to 753 of SEQ ID NO: 51, the nucleotide sequence 100 to 753 of SEQ ID NO: 53, the nucleotide sequence 100 to 753 of SEQ ID NO: 106 and the nucleotide sequence 100 to 753 of SEQ ID NO: 108.

32. A DNA comprising a nucleotide sequence selected from the group consisting of nucleotide sequence 84 to 2042 of SEQ ID NO: 88 and nucleotide sequence 84 to 2024 of SEQ ID NO: 116.

33. A recombinant DNA vector comprising DNA encoding a light chain polypeptide protein selected individually from the group consisting of the amino acid sequence 1 to 218 of SEQ ID NO: 50, the amino acid sequence 1 to 218 of SEQ ID NO: 52, the amino acid sequence 1 to 218 of SEQ ID NO: 54, the amino acid sequence 1 to 218 of SEQ ID NO: 107 and the amino acid sequence 1 to 218 of SEQ ID NO: 109.

~~34.~~ A recombinant DNA vector comprising DNA encoding a heavy chain polypeptide protein selected individually from the group consisting of the amino acid sequence 1 to 451 of SEQ ID NO: 89 and the amino acid sequence 1 to 451 of SEQ ID NO: 117.

~~35.~~ A host cell transformed with a recombinant DNA vector comprising DNA encoding a light chain polypeptide protein selected individually from the group consisting of the amino acid sequence 1 to 218 of SEQ ID NO: 50, the amino acid sequence 1 to 218 of SEQ ID NO: 52, the amino acid sequence 1 to 218 of SEQ ID NO: 54, the amino acid sequence 1 to 218 of SEQ ID NO: 107 and the amino acid sequence 1 to 218 of SEQ ID NO: 109.

~~36.~~ A host cell transformed with a recombinant DNA vector comprising DNA encoding a heavy chain polypeptide protein selected individually from the group consisting of the amino acid sequence 1 to 451 of SEQ ID NO: 89 and the amino acid sequence 1 to 451 of SEQ ID NO: 117.

~~37.~~ A host cell transformed with at least one recombinant DNA vector comprising DNA encoding a light chain polypeptide protein and DNA encoding a heavy chain polypeptide protein,

said light chain polypeptide protein comprising a sequence selected individually from the group consisting of the amino acid sequence 1 to 218 of SEQ ID NO: 50, the amino acid sequence 1 to 218 of SEQ ID NO: 52, the amino acid sequence 1 to 218 of SEQ ID NO: 54,

the amino acid sequence 1 to 218 of SEQ ID NO: 107 and the amino acid sequence 1 to 218 of SEQ ID NO: 109,

said heavy chain polypeptide protein comprising a sequence selected individually from the group consisting of the amino acid sequence 1 to 451 of SEQ ID NO: 89 and the amino acid sequence 1 to 451 of SEQ ID NO: 117.

38. The host cell of claims 35, 36 or 37, which is mammalian.

39. An *E. coli* which is selected from the group consisting of *E. coli* pHSGMM6 SANK73697 (FERM BP-6071), *E. coli* pHSGHM17 SANK73597 (FERM BP-6072), *E. coli* pHSGHH7 SANK73497 (FERM BP-6073), *E. coli* pSHM2 SANK 70198, *E. coli* pSHH5 SANK 70398 (FERM BP-6272), *E. coli* pGHSL7A62 (FERM BP-6274) SANK 73397 (FERM BP-6074) and *E. coli* pGHPDHV3 SANK 70298 (FERM BP-6273).

40. A method for producing a humanized anti-Fas antibody comprising culturing the host cell of claim 37, and then recovering the humanized anti-Fas antibody from the culture.

41. An agent for the treatment or prophylaxis of conditions attributable to abnormalities of the Fas/Fas ligand system comprising, as an active ingredient, the molecule of claims 1, 6, 8 or 9 in combination with a pharmaceutically acceptable carrier.

42. An agent for the treatment or prophylaxis of conditions attributable to abnormalities of the Fas/Fas ligand system comprising, as an active ingredient, the molecule of claims 1, 6, 8 or 9 in combination with a pharmaceutically acceptable carrier, wherein said condition is selected from the group consisting of an autoimmune disease, allergy, atopy, arteriosclerosis, myocarditis, cardiomyopathy, glomerular nephritis, hypoplastic anemia, hepatitis, acquired immunodeficiency syndrome and rejection after organ transplantation.

43. An agent for the treatment or prophylaxis of conditions attributable to abnormalities of the Fas/Fas ligand system comprising, as an active ingredient, the molecule of claims 1, 6, 8 or 9 in combination with a pharmaceutically acceptable carrier, wherein said condition is an autoimmune disease selected from the group consisting of systemic lupus erythematosus, Hashimoto's disease, rheumatoid arthritis, graft versus host disease, Sjögren syndrome, pernicious anemia, Addison's disease, scleroderma, Goodpasture syndrome, Crohn's disease, autoimmune hemolytic anemia, sterility, myasthenia gravis, multiple sclerosis, Basedow's disease, thrombopenia purpura and insulin dependent diabetes mellitus.

44. An agent for the treatment or prophylaxis of conditions attributable to abnormalities of the Fas/Fas ligand system

comprising, as an active ingredient, the molecule of claims 1, 6, 8 or 9 in combination with a pharmaceutically acceptable carrier, wherein said condition is an allergy.

45. An agent for the treatment or prophylaxis of conditions attributable to abnormalities of the Fas/Fas ligand system comprising, as an active ingredient, the molecule of claims 1, 6, 8 or 9 in combination with a pharmaceutically acceptable carrier, wherein said condition is rheumatoid arthritis.

46. An agent for the treatment or prophylaxis of conditions attributable to abnormalities of the Fas/Fas ligand system comprising, as an active ingredient, the molecule of claims 1, 6, 8 or 9 in combination with a pharmaceutically acceptable carrier, wherein said condition is arteriosclerosis.

47. An agent for the treatment or prophylaxis of conditions attributable to abnormalities of the Fas/Fas ligand system comprising, as an active ingredient, the molecule of claims 1, 6, 8 or 9 in combination with a pharmaceutically acceptable carrier, wherein said condition is selected from the group consisting of myocarditis and cardiomyopathy.

48. An agent for the treatment or prophylaxis of conditions attributable to abnormalities of the Fas/Fas ligand system comprising, as an active ingredient, the molecule of claims 1, 6,

8 or 9 in combination with a pharmaceutically acceptable carrier, wherein said condition is glomerular nephritis.

49. An agent for the treatment or prophylaxis of conditions attributable to abnormalities of the Fas/Fas ligand system comprising, as an active ingredient, the molecule of claims 1, 6, 8 or 9 in combination with a pharmaceutically acceptable carrier, wherein said condition is hypoplastic anemia.

50. An agent for the treatment of prophylaxis of conditions attributable to abnormalities of the Fas/Fas ligand system comprising, as an active ingredient, the molecule of claims 1, 6, 8 or 9 in combination with a pharmaceutically acceptable carrier, wherein said condition is hepatitis.

51. An agent for the treatment or prophylaxis of conditions attributable to abnormalities of the Fas/Fas ligand system comprising, as an active ingredient, the molecule of claims 1, 6, 8 or 9 in combination with a pharmaceutically acceptable carrier, wherein said condition is selected from the group consisting of fulminant hepatitis, chronic hepatitis, viral hepatitis, hepatitis C, hepatitis B, hepatitis D and alcoholic hepatitis.

52. An agent for the treatment or prophylaxis of conditions attributable to abnormalities of the Fas/Fas ligand system comprising, as an active ingredient, the molecule of claims 1, 6,

8 or 9 in combination with a pharmaceutically acceptable carrier, wherein said condition is rejection after organ transplantation.

53. An agent for the treatment or prophylaxis of conditions attributable to abnormalities of the Fas/Fas ligand system comprising, as an active ingredient, the molecule of claims 1, 6, 8 or 9 in combination with a pharmaceutically acceptable carrier, wherein said condition is acquired immune deficiency syndrome.

54. The molecule of claim 1, 6, 8 or 9 which has a property selected from the group consisting of:
inducing apoptosis in T cells expressing Fas;
ameliorating autoimmune symptoms in MRL gld/gld mice;
does not induce hepatic disorders;
a therapeutic or prophylactic effect on fulminant hepatitis;
a preventative effect on the onset of collagen-induced arthritis;
inducing apoptosis in synovial cells from a rheumatoid arthritis patient.

55. The molecule of claim 1, 6, 8 or 9 which has the following properties:
inducing apoptosis in T cells expressing Fas;
ameliorating autoimmune symptoms in MRL gld/gld mice;
does not induce hepatic disorders;
a therapeutic or prophylactic effect on fulminant hepatitis;
a preventative effect on the onset of collagen-induced arthritis;
inducing apoptosis in synovial cells from a rheumatoid arthritis patient.

56. A method for the treatment or prophylaxis of a condition attributable to an abnormality of the Fas/Fas ligand system comprising administration of an effective, non-toxic dose of the molecule of claim 1, 6, 8 or 9.

57. A method for the treatment or prophylaxis of a condition attributable to an abnormality of the Fas/Fas ligand system comprising administration of an effective, non-toxic dose of the molecule of claim 1, 6, 8 or 9, wherein said condition is selected from the group consisting of autoimmune diseases, allergy, atopy, arteriosclerosis, myocarditis, cardiomyopathy, glomerular nephritis, hypoplastic anemia, hepatitis, acquired immunodeficiency syndrome and rejection after organ transplantation.

58. The hybridoma HFE7A having the accession number FERM BP-5828.

59. A method for producing an antibody having an antigen binding region specific for an epitope of the Fas antigen, said method comprising culturing the hybridoma HFE7A having the accession number FERM BP-5828, and harvesting expressed antibody.

60. A method for producing an antibody, said method comprising culturing the hybridoma HFE7A having the accession number FERM BP-5828, and harvesting expressed antibody.

61. A humanized anti-Fas antibody molecule capable of, in cells having an abnormality in the Fas/Fas ligand system,

(a) inducing apoptosis by binding Fas on the cell surface, and in cells having no such abnormality,

(b) preventing apoptosis which would otherwise be induced by the binding of Fas ligand to the Fas antigen.

10
62. An antibody molecule comprising one or more heavy chain subunits having an amino acid sequence selected from the group consisting of:

the amino acid sequence 1 to 451 of SEQ ID NO: 143;

the amino acid sequence 1 to 451 of SEQ ID NO: 145;

the amino acid sequence 1 to 451 of SEQ ID NO: 147; and

the amino acid sequence 1 to 451 of SEQ ID NO: 157.

11
63. The antibody of claim 62, which has one or more light chain subunits having an amino acid sequence selected from the group consisting of:

the amino acid sequence 1 to 218 of SEQ ID NO: 107;

the amino acid sequence 1 to 218 of SEQ ID NO: 127;

the amino acid sequence 1 to 218 of SEQ ID NO: 129; and

the amino acid sequence 1 to 218 of SEQ ID NO: 131.

12
64. The antibody of claim 62, wherein the heavy chain consists essentially of the amino acid sequence 1 to 451 of SEQ ID NO: 157.

13/ 65. The antibody of claim ¹²64, wherein the light chain consists essentially of the amino acid sequence 1 to 218 of SEQ ID NO:

107.

546 14/ 66. The antibody of claim ¹⁰62, which consists essentially of two heavy chains and two light chains.

15/ 67. The antibody of claim ¹⁰62, which consists of two heavy chains and two light chains, said heavy chains each consisting essentially of the amino acid sequence 1 to 451 of SEQ ID NO: 157, and said light chains each consisting essentially of the amino acid sequence 1 to 218 of SEQ ID NO: 107.

16/ 68. An antibody molecule, wherein one or more light chain subunits have an amino acid sequence selected from the group consisting of:

the amino acid sequence 1 to 218 of SEQ ID NO: 127;

the amino acid sequence 1 to 218 of SEQ ID NO: 129; and

the amino acid sequence 1 to 218 of SEQ ID NO: 131, and one or more heavy chain subunits having an amino acid sequence selected from the group consisting of:

the amino acid sequence 1 to 451 of SEQ ID NO: 143;

the amino acid sequence 1 to 451 of SEQ ID NO: 145; and

the amino acid sequence 1 to 451 of SEQ ID NO: 147.

17
69. The antibody of claim ~~68~~¹⁶, wherein said light chain subunits have the amino acid sequence 1 to 218 of SEQ ID NO: 127, and one or more heavy chain subunits have the amino acid sequence 1 to 451 of SEQ ID NO: 143.

546
18
70. The antibody of claim ~~68~~¹⁶, wherein said light chain subunits have the amino acid sequence 1 to 218 of SEQ ID NO: 127, and one or more heavy chain subunits have the amino acid sequence 1 to 451 of SEQ ID NO: 145.

19
71. The antibody of claim ~~68~~¹⁶, wherein said light chain subunits have the amino acid sequence 1 to 218 of SEQ ID NO: 127, and one or more heavy chain subunits have the amino acid sequence 1 to 451 of SEQ ID NO: 147.

20
72. The antibody of claim ~~68~~¹⁶, wherein said light chain subunits have the amino acid sequence 1 to 218 of SEQ ID NO: 129, and one or more heavy chain subunits have the amino acid sequence 1 to 451 of SEQ ID NO: 143.

21
73. The antibody of claim ~~68~~¹⁶, wherein said light chain subunits have the amino acid sequence 1 to 218 of SEQ ID NO: 129, and one or more heavy chain subunits have the amino acid sequence 1 to 451 of SEQ ID NO: 145.

22

74. The antibody of claim 68, wherein said light chain subunits have the amino acid sequence 1 to 218 of SEQ ID NO: 129, and one or more heavy chain subunits have the amino acid sequence 1 to 451 of SEQ ID NO: 147.

23

75. The antibody of claim 68, wherein said light chain subunits have the amino acid sequence 1 to 218 of SEQ ID NO: 131, and one or more heavy chain subunits have the amino acid sequence 1 to 451 of SEQ ID NO: 143.

24

76. The antibody of claim 68, wherein said light chain subunits have the amino acid sequence 1 to 218 of SEQ ID NO: 131, and one or more heavy chain subunits have the amino acid sequence 1 to 451 of SEQ ID NO: 145.

25

77. The antibody of claim 68, wherein said light chain subunits have the amino acid sequence 1 to 218 of SEQ ID NO: 131, and one or more heavy chain subunits have the amino acid sequence 1 to 451 of SEQ ID NO: 147.

26

78. The antibody of claim 68, which consists essentially of two heavy chains and two light chains.

79. An agent for the prophylaxis or treatment of conditions involving an abnormality in the Fas/Fas ligand system, comprising the antibody of claim 62 as an active ingredient in combination with a pharmaceutically acceptable carrier.

80. An agent for the prophylaxis or treatment of conditions involving an abnormality in the Fas/Fas ligand system, comprising the antibody of claim 67 as an active ingredient in combination with a pharmaceutically acceptable carrier.

81. An agent for the prophylaxis or treatment of conditions involving an abnormality in the Fas/Fas ligand system, comprising the antibody of claim 68 as an active ingredient in combination with a pharmaceutically acceptable carrier.

82. A method of treatment of a condition involving an abnormality in the Fas/Fas ligand system, comprising administering a pharmaceutically effective amount of the antibody of claim 62 to a mammal in need thereof.

83. The method of claim 82, wherein the mammal is a human.

84. A method of treatment of a condition involving an abnormality in the Fas/Fas ligand system, comprising administering a pharmaceutically effective amount of the antibody of claim 67 to a mammal in need thereof.

85. The method of claim 84, wherein the mammal is a human.

~~86.~~ A method of treatment of a condition involving an abnormality in the Fas/Fas ligand system, comprising administering

a pharmaceutically effective amount of the antibody of claim 68 to a mammal in need thereof.

87. The method of claim 85, wherein the mammal is a human.

27
88. The antibody of claim ~~62~~ ¹⁰ that binds a peptide comprising the amino acid sequence of SEQ ID NO: 1.

Sub 28
89. The antibody of claim ~~67~~ ¹⁵ that binds a peptide comprising the amino acid sequence of SEQ ID NO: 1.

29
90. The antibody of claim ~~68~~ ¹⁶ that binds a peptide comprising the amino acid sequence of SEQ ID NO: 1.

91. A DNA encoding the antibody of claim 62.

92. A DNA encoding the antibody of claim 67.

93. A DNA encoding the antibody of claim 68.

94. A recombinant DNA vector comprising DNA encoding the antibody of claim 62.

95. A recombinant DNA vector comprising DNA encoding the antibody of claim 67.

96. A recombinant DNA vector comprising DNA encoding the antibody of claim 68.

97. A host cell transformed with a recombinant DNA vector comprising DNA encoding the antibody of claim 62.

98. A host cell transformed with a recombinant DNA vector comprising DNA encoding the antibody of claim 67.

99. A host cell transformed with a recombinant DNA vector comprising DNA encoding the antibody of claim 68.

100. A method for producing an anti-Fas antibody comprising culturing the host cell of claim 97, and recovering antibody from the resulting culture.

101. A method for producing an anti-Fas antibody comprising culturing the host cell of claim 98, and recovering antibody from the resulting culture.

102. A method for producing an anti-Fas antibody comprising culturing the host cell of claim 99, and recovering antibody from the resulting culture.

103. The agent of claim 79, wherein the disease is selected from the group consisting of: autoimmune diseases selected from the group consisting of systemic lupus erythematosus, Hashimoto's disease, rheumatoid arthritis, graft versus host disease, Sjögren syndrome, pernicious anemia, Addison's disease, scleroderma, Goodpasture syndrome, Crohn's disease, autoimmune hemolytic anemia, sterility, myasthenia gravis, multiple sclerosis, Basedow's disease, thrombopenia purpura and insulin dependent diabetes mellitus; allergy; rheumatoid arthritis; arteriosclerosis; myocarditis; cardiomyopathy; glomerular nephritis; hypoplastic anemia; hepatitis selected from the group consisting of fulminant hepatitis, chronic hepatitis, viral hepatitis further selected from the group consisting of hepatitis C, hepatitis B, hepatitis D and alcoholic hepatitis; and rejection after organ transplantation.

104. The agent of claim 80, wherein the disease is selected from the group consisting of: autoimmune diseases selected from the group consisting of systemic lupus erythematosus, Hashimoto's disease, rheumatoid arthritis, graft versus host disease, Sjögren syndrome, pernicious anemia, Addison's disease, scleroderma, Goodpasture syndrome, Crohn's disease, autoimmune hemolytic anemia, sterility, myasthenia gravis, multiple sclerosis, Basedow's disease, thrombopenia purpura and insulin dependent diabetes mellitus; allergy; rheumatoid arthritis; arteriosclerosis; myocarditis; cardiomyopathy; glomerular nephritis; hypoplastic anemia; hepatitis selected from the group consisting of fulminant hepatitis, chronic hepatitis, viral hepatitis further selected from the group consisting of hepatitis C, hepatitis B, hepatitis D and alcoholic hepatitis; and rejection after organ transplantation.

105. The agent of claim 81, wherein the disease is selected from the group consisting of: autoimmune diseases selected from the group consisting of systemic lupus erythematosus, Hashimoto's disease, rheumatoid arthritis, graft versus host disease, Sjögren syndrome, pernicious anemia, Addison's disease, scleroderma, Goodpasture syndrome, Crohn's disease, autoimmune hemolytic anemia, sterility, myasthenia gravis, multiple sclerosis, Basedow's disease, thrombopenia purpura and insulin dependent diabetes mellitus; allergy; rheumatoid arthritis; arteriosclerosis; myocarditis; cardiomyopathy; glomerular nephritis; hypoplastic anemia; hepatitis selected from the group consisting of fulminant hepatitis, chronic hepatitis, viral hepatitis further selected from the group consisting of hepatitis C, hepatitis B, hepatitis D and alcoholic hepatitis; and rejection after organ transplantation.

106. A transformant strain of *E. coli* selected from the group consisting of FERM BP-6512, FERM BP-6511, FERM BP-6513, FERM BP-6515, FERM BP-6514, FERM BP-6516 and FERM BP-6510.

107. A first polypeptide protein having an amino acid sequence selected from the group consisting of the amino acid sequence 1 to 218 of SEQ ID NO: 127, the amino acid sequence 1 to 218 of SEQ ID NO: 129 and the amino acid sequence 1 to 218 of SEQ ID NO: 131, together with a second polypeptide protein having an amino acid sequence selected from the group consisting of the amino acid sequence 1 to 451 of SEQ ID NO: 143, the amino acid sequence 1 to 451 of SEQ ID NO: 145 and the amino acid sequence 1 to 451 of SEQ ID NO: 147, said first polypeptide protein and said second polypeptide protein constituting a Fas-specific antibody.

108. A DNA encoding the first polypeptide according to claim 107.

109. A DNA encoding the first polypeptide according to claim 107, and which comprises a nucleotide sequence 99 to 752 of SEQ ID NO: 126.

110. A DNA encoding the first polypeptide according to claim 107, and which comprises a nucleotide sequence 99 to 752 of SEQ ID NO: 128.

111. A DNA encoding the first polypeptide according to claim 107, and which comprises a nucleotide sequence 99 to 752 of SEQ ID NO: 130.

112. A DNA encoding the first polypeptide according to claim 107, and which comprises a nucleotide sequence 80 to 2038 of SEQ ID NO: 142.

113. A DNA encoding first polypeptide according to claim 107, and which comprises a nucleotide sequence 80 to 1038 of SEQ ID NO: 144.

114. A DNA encoding the first polypeptide according to claim 107, and which comprises a nucleotide sequence 80 to 2038 of SEQ ID NO: 146.

115. A recombinant DNA vector comprising the DNA according to any one of claims 108, 109, 110, 111, 112, 113 or 114.

116. A host cell transformed with a recombinant DNA vector according to claim 115.

117. A host cell transformed with a recombinant DNA vector comprising the DNA of any one of claims 109, 110, 111, 112, 113 or 114, and combinations thereof.

~~118.~~ A host cell transformed with a first recombinant DNA vector and a second recombinant DNA vector, said first recombinant DNA vector comprising a DNA encoding the polypeptide according to claim 107 and comprising a nucleotide sequence 99 to 752 of a SEQ ID NO selected from the group consisting of said SEQ ID NO: 126; SEQ ID NO: 128 and SEQ ID NO: 129; and said second recombinant DNA vector comprising a DNA encoding the polypeptide according to claim 107 and comprising nucleotide sequence 80 to 2038 of a SEQ ID NO selected from the group consisting of SEQ ID NO: 142, SEQ ID NO: 144 and SEQ ID NO: 146.

119. The host cell of claim 116, which is a mammalian.

ADD
B4